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STANDARD REQUIREMENTS FOR PULP & PAPER INDUSTRY IN RUSSIA

Technical Regulation of Customs Union 032/2013

Bachelor's thesis

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THESIS
Abstract

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Abstract

The main purpose of the study was to clarify the requirements of Russian standards for pressure equipment and provide the information for quality management improvement for a well-known international case company. It is one of the leading global suppliers of systems, equipment and services for pulp and paper industry.

In European Union (EU) Directive 97/23/EC (PED 2014/68/EU transition on 19.07.2016) harmonized standards are used for pressure equipment where as in Russia TR CU 032/2013 and GOSTs are followed. The main reason for this study was to analyze what are the main differences between PED 97/23/EC (2014/68/EU)/GOST and TR CU 032/2013.

The Company provided most of the necessary information and technical material needed for making this thesis. Information was also collected from different web links, by interviewing specialists, but most of the information was collected and analyzed from Pressure Equipment Directive and Technical Regulation of Customs Union for equipment working under excessive pressure.

In the theoretical and published part of the study the new technical regulations of customs union TR CU 032/2013 on the safety of equipment working under excessive pressure are analyzed and compared with PED and GOST on general level.

Also a more detailed TR CU 032/2013 regulations process guide was made for the case company. This guide was made for the use of the whole company and intended primarily for those who don't have earlier experience of TR CU 032/2013. The guide will help to understand what steps and quality documentation are needed in order to fulfill the TR CU 032/2013 and because of its special nature and value for the case company, it is not included in the public report.

The original goals for thesis were set by the case company. The key points of the code changes and TR CU 032/2013 process guide were approved by them and evaluated as excellent. As a proof of company approval thesis material and the process guide are taken into use in their next coming Russian projects.

Keywords

Technical regulation, Customs Unions, TR CU 032/2013, PED, GOST,Standard

CONTENTS

1 INTRODUCTION

Each country has its own norms, standards and regulations for equipment which is produced for the first time and intended for use in Pulp and Paper industry. The main steps of new technical regulations of customs union TR CU 032/2013 on the safety of equipment working under excessive pressure and information to reduce the risks when importer goes into Russian market will be described in this bachelor's thesis. In Finland and in the European Union (EU) Directive 97/23/EC (PED 2014/68/EU transition on 19.07.2016) harmonized standards used for pressure equipment and in Russia TR CU 032/2013 and GOSTs (GOST is an acronym of gosudarstvennyy standart (Russian: государственный стандарт) Simply, it means "State Standard"). The main goal of the thesis was to clarify the requirements of Russian standards for pressure equipment and provide the information for quality management improvement. The thesis was made for a well-known international case company. It is one of the leading global suppliers of systems, equipment and services for pulp and paper industry - including wood processing, fiber processing, chemical recovery, stock preparation - as well as for biomass boilers, biomass pelleting plants, and gasifiers for energy production. The quality of products and services is a key factor to sustain reliable and efficient processes.

This study was chosen because of its need and relevance. Finland and Russia, with 1340 km of common border have had a strong connection with each other. It is very important and useful to have global co-operation between these two countries. For these reasons it is necessary to know the Russian standards requirements, know exactly how to implement products and follow the changes in regulations. Case company is interested in connections with Russia and it's needed to know which technical regulations are applied for Pulp & Paper industry. Also, there is a question of differences between EU and Russian standards. This is very important for both countries because it will be easier to have cooperation in manufacturing field. These are the main reasons for this topic of the thesis.

Firstly, it may seem that the systems of EU and Russian standards (Directive and TR CU) are similar, but they have many differences. For example there is a difference in certification and declaration procedures. Also for company case the differences between GOST and TR CU 032/2013 are needed. Those differences between PED 97/23/EC (2014/68/EU)/GOST and TR CU 032/2013 are presented in this work. Also, general information on how to reduce the risks of contracting is presented there.

1.1 Abbreviations

ASME	American Society of Mechanical Engineers
CEN	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardization
DN	Nominal diameter
EAC	Eurasian Conformity mark
EAEC or EurAsEC	Eurasian Economic Community
ESOs	The European Standardization Organizations

ETSI	European Telecommunications Standards Institute
EU	Europe Union
GOST	Gosudarstvennyy standart, it means "State Standard"
ICT	Information and communications technology
ISO	International Organization for Standardization
NoBo	Notified Body
PED	Pressure Equipment Directive
PER	Pressure Equipment Regulations
PS	Maximum allowable pressure
SEP	Sound Engineering Practice
TR CU	Technical Regulation of Custom Union
USSR	Union of Soviet Socialist Republics
V	Volume
WTO	World Trade Organization

2 GENERAL INFORMATION ABOUT EU AND RUSSIAN STANDARDS

Our life is surrounded by many different standards we may not know about, but we use standards every day. There are many different standards in the world. Clothing and shoe sizes, food packaging, toys, health care products, screws, nuts, and many other familiar things in the market are based on standards. All manufacturing and construction as well as installation, repairing and maintenance work is conducted in accordance with national or even international standards. In addition, using systems, devices, and equipment, as well as operating processes and maintaining them, requires standards as well.

What is a standard and why do we need them?

A Standard is a document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes and services are fit for their purpose. (ISO. Standards, 2015)

The standards cover a wide range of areas, from construction to nanotechnology, from energy management to health and safety. They may be specific, for example, to treat a particular type of product, or general, such as board techniques.

Standards provide (ETSI. Why we need standards, 2015):

- **Safety and reliability** – Adherence to standards helps ensure safety, reliability and environmental care. As a result, users perceive standardized products and services as more dependable – this in turn raises user confidence, increasing sales and the take-up of new technologies.
- **Support of government policies and legislation** – Standards are frequently referenced by regulators and legislators for protecting user and business interests, and to support government policies. Standards play a central role in the European Union's policy for a Single Market.
- **Interoperability** – the ability of devices to work together relies on products and services complying with standards.
- **Business benefits** – standardization provides a solid foundation upon which to develop new technologies and to enhance existing practices. Specifically standards:
    - Open up market access
    - Provide economies of scale
    - Encourage innovation
    - Increase awareness of technical developments and initiatives
- **Consumer choice** - standards provide the foundation for new features and options, thus contributing to the enhancement of our daily lives. Mass production based on standards provides a greater variety of accessible products to consumers.

Without standards we cannot be sure about quality of product that we are using. It might not work as expected or in some cases it might be dangerous for our health. Our world will be much more difficult without standards.

In every country they have they own standards and if a product is manufactured according to those standards then it is accepted in the national market. In some cases the standards can be common for many countries, for example PED and harmonized standards for EU-market or technical regulations of customs union (TR CU 032/2013) for Russia, Belarus and Kazakhstan. Using standards removes barriers of trade.

2.1 European standards organizations

European Standards (EN) are documents that have been ratified by one of the 3 European Standards Organizations, CEN, CENELEC or ETSI. They are designed and created by all interested parties through a transparent, open and consensual process. European Standards are a key component of the Single European Market. Though rather technical and unknown to the general public and media, they represent one of the most important issues for business. Although often perceived as boring and not particularly relevant to some organizations, managers or users, they are actually crucial in facilitating trade and hence have high visibility among manufacturers inside and outside the European territory. A standard represents a model specification, a technical solution against which a market can trade. It codifies best practice and is usually state of the art. (CENELEC. European standards, 2015)

ESOs- The European Standardization Organizations

The three European Standardization Organizations, CEN, CENELEC and ETSI are officially recognized as competent in the area of voluntary technical standardization. The European Union (EU) Regulation (1025/2012) which settles the legal framework for standardization, has been adopted by the European Parliament and by the Council of the EU, and entered into force on 1 January 2013. (CENCENELEC. European Standardization Organizations, 2015)

CEN -European Committee for Standardization

CEN is a regional standardization organization, which organizes European standardization in all domains, except electrotechnology and telecommunications. It was founded in 1961 and it brings together the National Standardization Bodies of 33 European countries. It provides a foundation for the development of European Standards and other technical documents on different types of products, materials, services, processes. (European Committee for standardization, 2015)

More than 60,000 technical experts as well as business federations, consumer and other societal interest organizations are involved in the CEN network that reaches over 480 million people. (Standartization supporting innovation and growth, 2010)

CEN is contributing to the objectives of the European Union and European Economic Area with technical standards (EN standards) which promote free trade, the safety of workers and consumers, interoperability of networks, environmental protection, exploitation of research and development programmes, and public procurement. An example of mandatory standards are those for materials and products used in construction and listed under the Construction Products Directive. The CE mark is a declaration by the manufacturer that a product complies with the respective EU directive and hence the harmonized standard(s) referenced by the directive(s). (European Committee for standardization, 2015)

CENELEC - European Committee for Electrotechnical Standardization

CENELEC is the European Committee for Electrotechnical Standardization and is responsible for standardization in the electrotechnical engineering field. CENELEC prepares voluntary standards, which help facilitate trade between countries, create new markets, cut compliance costs and support the development of a Single European Market. It was created in 1973 as a result of the merger of two previous European organizations: CENELCOM and CENEL. (CENELEC, 2015)

ETSI - European Telecommunications Standards Institute

ETSI is a worldwide organization founded in 1988. It produces globally-applicable standards for information and communications technology (ICT). These standards also include fixed, mobile, radio, converged, broadcast, and internet technologies. ETSI's purpose is to produce and maintain the technical standards required by its members. (ETSI. About ETSI, 2016)

The New Approach and European standardization have contributed significantly to the development of the Single Market. The success of the European standardization system, in removing technical barriers to trade, has played a vital role in ensuring the free movement of goods between Member States.

European Union New Approach directives and standards

New Approach, effective since 1985, is an important tool in products regulation. Global Approach has been developed for attestation of conformity. Both approaches simplify and accelerate EU legislation. According to these approaches, only the essential requirements concerning the product are included in directives. EU gives a standardization mandate to European Standards Organizations that develop standards in accordance with the directive requirements. Using standards is voluntary, but by applying them it is usually easier to prove that products meet regulatory (directives') safety requirements. List of standards that relate to New Approach directives are published in the Official Journal of the European Union. (Finnish Standards Association SFS, 2016)

Within the context of the European New Approach Directives this is the process by which persons can legally place safe and compliant products onto the European market (or bring them into use) for the first time. Conformity assessment is a common feature of the New Approach Directives concerned with product safety, and includes various checks on the:

- design and construction of products to meet essential requirements which normally are for health and safety
- and being able to demonstrate this through a technical file

before declaring and certifying a products' conformity with all relevant Directives, and affixing CE marking to the product. Some products can be self-certified through this process, but others must undergo one of a number of specific conformity assessment procedures involving third parties known as Notified or Conformity Assessment Bodies, before the manufacture can declare conformity. (HSE. Conformity assessment, 2016)

2.2 Russian Federation standards

The history of national standards in the USSR can be traced back to 1925, when a government agency, later named Gosstandart, was established and put in charge of writing, updating, publishing, and disseminating the standards. After World War II, the national standardization program went through a major transformation. The first GOST standard, GOST 1 *State Standardization System*, was published in 1968. The level of technical development as well as the need for development and introduction of informational calculating systems and many other factors lead to creating complexes of standards and a number of large general technical standard systems. (GOST, 2016)

The task of harmonization of Russia's standards and the GOST standards was set in 1990 by the Soviet Council of Ministers at the beginning of the transit to market economy. At that time they formulated a direction that obeying the GOST standards may be obligatory or recommendable. The obligatory requirements are the ones that deal with safety, conformity of products, ecological friendliness and inter-changeability. The Act of the USSR Government permitted applying of national standards existing in other countries, international requirements if they meet the requirements of the people's economy. (GOST, 2016)

The state standards (GOST) were compulsory documents for all enterprises and organizations regardless of their rank within various branches of industry until 1992. Since 1992, the state standards have been voluntary, but nevertheless containing obligatory requirements. In accordance with the Federal Law «On Technical Regulating», adopted at the end of 2002, for the next seven years the obligatory requirements for products, processes of production, operation, storage, transportation, marketing and utilization would be included in Technical Regulations, adopted by Federal Laws. (ISO. Russian Federation (GOST R), 2016)

During the past years a large number of GOST standards were developed and approved. Nowadays there is a process of their revision so that they conform international standard requirements. As the base is the system of international standards ISO, in Russia they created series of Russian standards such as GOST ISO 9001 or GOST ISO 14001, which absorbed the best developments of the world community but they also consider the Russia's specific. (GOST, 2016)

In May 2004, the State Committee for the Russian Federation for Standardization and Metrology was transformed into the Federal Agency on Technical Regulating and Metrology (GOST R). Nowadays the Federal Agency on Technical Regulating and Metrology (GOST R) is the Federal Executive Body, implementing inter-industry coordination and functional regulating in the fields of standardization, metrology and conformity assessment. The Federal Agency on Technical Regulating and Metrology (GOST R) holds the function of National Standards Body in the Russian Federation and represents Russia in international (and regional) organizations for standardization. (ISO. Russian Federation (GOST R), 2016)

2.3 General introduction into Customs Union

On January 1, 2010, the Russia – Kazakhstan - Belarus Customs Union came into effect and as of July 1, 2011, all customs borders between these three states were removed. Most of the products are moved under single Customs Union's rules. As a result, customs clearance of goods originating in any of these three states, along with goods that have been imported into one of these three states from other countries and released for free circulation, may be transferred between the three states without undergoing customs clearance and customs control procedures. In August 2012, Russia was accepted to WTO which created customs tariff changes for the Customs Union. In the end, it is believed that Russia's entrance into the WTO will equalize trade among the Customs Union and its trading partners. (Custom Union Certification and Declaration. Customs Union Certificate - EAC, 2015)

The key aspects in the legislation of the Customs Union include (Custom Union Certification and Declaration. Customs Union Certificate - EAC, 2015):

1. A Common Economic Space – an economic union which is the ultimate integration of the three countries to achieve common economic development goals followed by the harmonization of the three countries' various policies, including their economic policy and industrial support policies. The formal establishment of the Economic Union will take some time and effort.
2. Customs duties are posted to a general account and then distributed among the member states of the Customs Union according to a national budget: Regarding VAT related to trade between the member states, VAT is refunded to the seller of goods in one country (the exporter) while the purchaser in the other country (the importer) pays VAT to the tax authorities of its country. VAT rates are 18 percent in Russia, 20 percent in Belarus and 12 percent in Kazakhstan. It is unlikely that these rates will be unified in the foreseeable future.

<u>Customs Duties by Location</u>
Russia 87.97 %
Belarus 7.33 %
Kazakhstan 4.70 %

According to the Russian and Customs Union's laws and requirements, more than 80% of all products to be sold or used in Russia or Customs Union (CU) require mandatory certification, i.e. they should be approved by relevant local authorities in terms of compliance to national or CU standards. The programme covers a wide range of products such as cosmetics, food products, toys, textiles, mechanical and electrical goods and industrial equipment for food, chemical, oil & gas, construction and other industries. This concerns both locally produced and imported goods. Main objective of the programme is protecting safety, health and environment of people in Russia and Customs Union. (INTERTEK. Russian Federation and customs union, (pdf file), 2015)

Over 60 sets of Technical Regulations have so far been adopted. All products that fall under any of those categories are subject to mandatory TR CU Certification of Conformity.

The three members of the Customs Union agreed on common principles and rules for technical regulation, and established a uniform list of products subject to mandatory certification procedures in the Customs Union. It was also ruled that none of the CU member-states may add a product to their respective national Mandatory Certification List, if it is not included in the Uniform list. (Russian standard. List of technical regulations, 2015)

All products divided into 61 categories, each to be governed by a specific set of Technical Regulations of the Customs Union (TR CU). Objectives (Russian standard. List of technical regulations, 2015):

- safety;
- environment protection;
- prevention of actions misleading customers;
- energy efficiency and resources saving.

2.4 What is conformity assessment?

A manufacturer can only place a product on the EU market when it meets all the applicable requirements. The conformity assessment procedure is carried out before the product can be sold. The European Commission's main objective is to help ensure that unsafe or otherwise non-compliant products do not find their way to the EU market. (Europe Commission, 2016)

Conformity assessment involves a set of processes that show your product, service or system meets the requirements of a standard. Undergoing the conformity assessment process has a number of benefits (ISO. What is conformity assessment?, 2016):

- It provides consumers and other stakeholders with added confidence.
- It gives company a competitive edge.
- It helps regulators ensure that health, safety or environmental conditions are met.

The main forms of conformity assessment are testing, certification, and inspection.

Certification

Certification is the provision by an independent body of written assurance (a certificate) that the product, service or system in question meets specific requirements. Certification is also known as third party conformity assessment. (ISO. What is conformity assessment?, 2016)

Testing

Testing is the determination of one or more of an object or product's characteristics and is usually performed by a laboratory. (ISO. What is conformity assessment?, 2016)

Inspection

Inspection describes the regular checking of a product to make sure it meets specified criteria. (ISO. What is conformity assessment?, 2016)

Depending on the Directive and the nature of the product and risk conformity assessment ranges from self-assessment of the product to third party type-examination and /or full quality assurance. Full details of the procedures (also referred to as modules) are given, normally within the Annexes, of each European product safety Directive. Manufacturers and their authorised representatives need to find out what these procedures are for any of their products destined for the European market. Information generated and obtained during the conformity assessment procedure must be retained by the Responsible Person as part of the product's technical file. (HSE. Conformity assessment, 2016)

More detailed information about conformity assessment for Pulp & Paper industry will be written under chapter 3 and chapter 4.

2.4.1 Conformity assessment in Europe.

The conformity assessment in Europe is carried out by the manufacturer. A third party is involved in the conformity assessment process if the applicable legislation requires it.

EC Type-Examination Certificate always involves the use of a third party – Notified Body (hereinafter -NoBo) which is independent from manufacturer and purchaser of the product. The Responsible Person must select an appropriate competent organisation known as a Conformity Assessment or Notified Body[5] to assist. However, whilst the Notified Body will undertake and assessment of the product and the manufacturer's quality system, and may issue an EC Type-Examination Certificate, the duty to meet the relevant conformity assessment procedure always remains with the Responsible Person. It is the Responsible Person who must declare the product's conformity with all relevant Directives and apply the CE mark before placing the product on the market. (HSE. Conformity assessment, 2016)

If a Notified Body issues an EC Type-Examination Certificate for a product submitted to them for conformity assessment this must be retained by the Responsible Person and included in the technical file. There is sometimes confusion as to what the EC Type-examination certificate means. It is a document indicating that in the Notified Bodies' judgement the product meets the requirements of one or more Directives. It is not a Declaration of Conformity, although details of any Notified Body issuing such a certificate should be included on the Declaration of Conformity. (HSE. Conformity assessment, 2016)

The Declaration of conformity / Manufacturer Declaration for conformity assessment is carried out by Manufacturer without NoBo involvement. This applies to many products that are not considered of high or special risk.

As part of conformity assessment, the manufacturer or the authorised representative must draw up an Declaration of conformity (DoC). The declaration should contain all information to identify (Europe Commission, 2016):

- the product
- the legislation according to which it is issued
- the manufacturer or the authorised representative
- the notified body if applicable
- a reference to harmonised standards or other normative documents, where appropriate.

The Responsible Person approaching a Notified Body, or another organisation, to assist with his product assessment but if a Notified Body is used it only as a consultant and no EC Type-Examination Certificate must be issued and the number of the Notified Body must not be quoted on the Declaration of Conformity. (HSE. Conformity assessment, 2016)

2.4.2 Conformity assessment in the territory of Customs Union

The Russian Federal Law №184 on Technical Regulation (TR) dated of 27.12.2002 established the rules of state regulatory requirements for industrial and consumer goods. Since 2010 Russian TR certification replaced the GOST R Certification for certain products and equipment. Currently, Russian Technical Regulations have been almost completely replaced by Customs Union’s Technical Regulations. (INTERTEK, 2015)

There are two forms of compliance documents issued per shipment or for serial production from 1 up to 5 years (INTERTEK, 2015):

- TR Certificate of Conformity;
- TR Declaration of Conformity.

2.4.2.1 TR CU Certification of Conformity

The Certificate of the Customs Union (CU certification) – is an official document confirming the quality of production to approved standards within the territory of the Customs Union.The Certificate of the Customs Union (CU certification) is necessarily required for entry into the market of the Customs Union by the customs of each Member State. The aim was to appeal technical obstacles, such as the compulsory certification trade between three countries and to reduce the number of mandatory technical procedures for the importation of goods into and export of goods from the territory of the Customs Union. (GOST R-Info. Certificate of Customs Union Russia, Kazakhstan, Belarus, 2016)

The Certificate of the Customs Union can be used for export of goods to any country - Russia, Belarus and Kazakhstan. The certificate is also valid on the territory of each country. In this way, every company can export its goods to each country, on the basis of one certificate of conformity. Certificate replaces the Customs Union International certifications of Russia, Belarus and Kazakhstan. The Certificate of conformity of the Customs Union confirms the safety requirements and electromagnetic compatibility and allows exporters and producers to spread their goods on the territory of the Customs Union. (GOST R-Info. Certificate of Customs Union Russia, Kazakhstan, Belarus, 2016)

Unfortunately, this certificate can not be used instead of the Communications Compliance Certificates, Fire Safety Certificates, National Registry and other mandatory or voluntary certification of compliance. Without looking at it, the certificate of conformity of the Customs Union - is the easiest way to enter the market of three countries at the same time - Russia, Belarus and Kazakhstan. The Customs Union Certificate is issued for a maximum period of 5 years. (GOST R-Info. Certificate of Customs Union Russia, Kazakhstan, Belarus, 2016)

Types of certificates

Depending on the nature of the goods shipped to Russia, the exporter may need to comply with one or more certification requirements. There are various mandatory certification systems regulated by Laws of the Russian Federation and of the Customs Union such as "GOST R", "TR", "Sanitary registration", etc, and several voluntary ones. However, the procedure may also include any combination of certificates, permits, licences and other approvals. These include but are not limited to:

- TR CU Certificate and Declaration of Conformity (to Customs Union)
- State Registration certificate (to Customs Union)
- TR RF Certificate and Declaration of Conformity (to Russia)
- GOST R Certificate and Declaration of Conformity (to Russia)
- GOST R Pattern Approval Certificate
- Fire Safety Certificate
- Telecom Type Approval Certificate
- Permit (authorisation) of Radio-frequency Center
- FSB notification (for devices equipped with Bluetooth)
- Exemption Letter

- Etc.

Certificates are issued per product or per type of products. That means that one shipment or a range of products may require several similar or different certificates. (INTERTEK, 2015)

Any certificate require a local Applicant Company, which is representing the Producers in the abroad. This company should be registered in the territory of Customs Union. (Custom Union Certification and Declaration. Customs Union Certificate - EAC, 2015)

2.4.2.2 TR CU Declaration of Conformity

This is an official document confirming that the product was manufactured (as well as developed) in full compliance with all applicable requirements in place and technical rules that are described in certain Technical Regulations of Customs Union. In case when the issue of such declaration is mandatory for certain type of product or goods then it will not be possible for manufacturer or retailer to freely and legally produce and sell their goods, as well as to effect export-import operations of the above said. (Custom Union Certification and Declaration. Custom Union Declaration – EAC, 2015)

According to the valid publications of Eurasian Economic Community (EAEC or EurAsEC), all products divided into two parts and for some of them it is enough to issue TR CU Declaration of Conformity. (Custom Union Certification and Declaration. Customs Union Certificate - EAC, 2015)

TR CU Declaration of Conformity can be issued for certain quantity, shipment base or for serial production up to 5 years. To provide Customs Union Declaration of Conformity, factory audit by Experts and physical sample testing is NOT required. Annual inspection control is not applicable in the certificate validation period. All Declaration of Conformity of the Customs Union are registered in the Unified Register of Declaration of conformity issued using a common form. (Custom Union Certification and Declaration. Customs Union Certificate - EAC, 2015)

The obligation to obtain a Certificate or a Declaration is determined by requirements of Technical Regulations applicable to the product. The product compliant with Russian Technical Regulation is marked by the registered TR mark of Conformity which clearly demonstrates the product's compliance to the applicable Russian requirements. (INTERTEK, 2015)

If we compare the declaration TR CU with the certificate TR CU, we can note the same legal effect in both documents, and the difference between them lies only in the fact that by the declaration TR CU responsibility for the quality of the object lies entirely only on the applicant and by the certificate TR CU – on certification authority. Thus, the information is entered in the declaration not on behalf of Centre of certification, but on behalf of the applicant. (Custom Union Certification and Declaration. Customs Union Certificate - EAC, 2015)

3 DIFFERENCES BETWEEN PED 2014/68/EU AND TR CU 032/2013

3.1 Structure of PED 2014/68/EU (97/23/EC)

The **Pressure Equipment Directive 97/23/EC** (PED 2014/68/EU transition on 19.07.2016) of the EU sets out the standards for the design and fabrication of pressure equipment ("pressure equipment" means steam boilers, pressure vessels, piping, safety valves and other components and assemblies subject to pressure loading) generally over one liter in volume and having a maximum pressure more than 0.5 bar gauge. It also sets the administrative procedures requirements for the "conformity assessment" of pressure equipment, for the free placing on the European market without local legislative barriers. It has been mandatory throughout the EU since 30 May 2002. This is enacted in the UK as the Pressure Equipment Regulations (PER). The set out standards and regulations regarding pressure vessels and boilers safety is also very close to the US standards defined by the American Society of Mechanical Engineers (ASME). This enables most international inspection agencies to provide both verification and certification services to assess compliance to the different pressure equipment directives. (Pressure Equipment Directive,2016)

According to Directive text (DIRECTIVE 2014/68/EU) I give an overview of legal framework, products covered, objectives essential requirement, conformity assessment and PED contents in the following way:

Legal Framework

The European Parliament and the Council Directive 97/23/EC on pressure equipment (PED) is based on Article 114 of the Treaty on the Functioning of the European Union and is one of the main product harmonization Directives based on the "New Approach" principles. The Pressure Equipment Directive (PED) is transposed into national law by the EU Member States.

Products covered

The Pressure Equipment Directive covers a very broad range of products such as vessels, pressurized storage containers, heat exchangers, steam generators, boilers, industrial piping, safety devices and pressure accessories. Such equipment is widely used in the process industries (oil & gas, chemical, pharmaceutical, plastics and rubber and the food and beverage industry), high temperature process industry (glass, paper and board), energy production and in the supply of utilities, heating, air conditioning and gas storage and transportation.

Objectives

The legal framework established by the Pressure Equipment Directive aims to guarantee free movement of these products in the internal market while ensuring a high level of safety.

Essential Requirements

The Pressure Equipment Directive contains in its Annex I the Essential Requirements that a pressure equipment or assembly must meet when placed and/or put into service on the EU market. It does

not indicate how these requirements must be met, thus leaving flexibility to manufacturers as regards technical solutions to be adopted.

Conformity Assessment

The PED requires third party involvement in the conformity assessment of products depending on the level of the hazard. For I –IV categories Declaration of Conformity is required (Annex IV) and Certification of Conformity is needed if third party (NoBo) involved, depends on the module (for example for modules D, E and H).

PED Contents:

- Scope, definitions, exclusions
- Technical requirements and CE-marking
- Classification (product (fluid) group, PS, V/DN, figure, hazard category)
- Conformity assessment
- Annex I Essential safety requirements
- Annex II Conformity assessment tables 1-9
- Annex III Conformity assessments procedures (modules)
- Annex IV EU Declaration of conformity
- Annex V Part A, Part B
- Annex VI Correlation table

3.2 Structure of TR CU 032/2013

Technical Regulations of the Customs Union «On the safety equipment, working under excess pressure» (TR CU 032/2013) came into force on 01.02.2014 and establishes unified obligatory for application and enforcement requirements for the safety to equipment operating under excessive pressure, which is put into circulation for the first time and intended for use in the territory of the Customs Union. This technical regulation establishes safety requirements for equipment in the development (design), production (manufacturing), as well as labelling requirements for equipment in order to protect human life and health, property, and prevent actions that result into misleading of consumers. (TP TC 032/2013)

According to Technical regulation text (TP TC 032/2013) I give an overview of legal framework, products covered, objectives essential requirement, product categories, conformity assessment and TR CU 032/2013 contents in the following way:

Legal framework

The present technical regulations have been developed in accordance with the Agreement on common principles and rules of technical regulation in the Republic of Belarus, the Republic of Kazakhstan and the Russian Federation as of November 18, 2010.

Adopted by the Resolution of the Council of the Eurasian Economic Commission No.: 41 as of July 2, 2013

Products covered in technical regulations:

TR CU 032/2013 covers high pressure equipment, its parts and components, safety devices. Types of equipment:

- vessels for gases, liquefied gases, dissolved under pressure, and steam(vapours), used for working mediums of group 1 and group 2
- vessels for liquids used for working mediums of group 1 and group 2
- steam, hot water boilers, having and fired vessels
- pipelines for gases and steam(vapours) and used for working mediums of group 1 and group 2.
- pipelines for liquids and used for working mediums of group 1 and group 2
- pressure-resistant items of equipment (assembly units) and accessories thereto;
- valves (pipes fittings)
- indicating and safety devices;
- pressure chambers (except for single medical pressure chambers);
- safety devices and equipment.

Product categories

Pressurized equipment as vessels or pressure pipes are classified into four categories depending on the technical parameters (volume, pressure, media, diameter). The categorization determines the conformity assessment scheme, ranging from declaration with manufacturer's proofs up to certification with testing and/or inspection controls.

Conformity Assessment

1. Declaration of conformity.
    - Declaration of conformity is issued for the Category 1 and Category 2 products and for devices manufacturing of which takes place in the location of operating of the device and the manufacturing process include the use of permanent connections. Valid time of declarations of conformity is up to 5 years.
    - Declaration of conformity based on own evidence, and (or) evidence obtained with the participation of the certification body or an accredited testing laboratory included in the Unified Register of certification bodies and testing laboratories of the Customs Union.

2. Certificate of conformity.
    - Certification is used for the product Category 3 and Category 4. The valid time of certificate is up to 5 years.
    - Certification conformity is carried out by an accredited certification body included in the Unified Register of certification bodies and testing laboratories of the Customs Union.

TR CU 032/2013 Contents:

- Scope, definitions, market circulation rules
- Ensuring the safety of equipment (technical documentation, passports, operating manual)
- Conformity assessment (certification and declaration schemes)
- EAC – marking
- Disclaimer
- App. 1 Classification of high pressure equipment, by hazard categories, Table 1-9
- App. 2 Equipment safety requirements
- App. 3 Requirements for distinctive coloring and identification information

3.3 Comparison of New PED 2014/68/EU and TR CU 032/2013

Requirements of Russian Standards and Rules are different from EC ones, and almost always they are more strict.

European Directive PED 97/23 came into effect actually in 2002, upon adoption of appropriate Annexes thereto. New PED (2014/68/EU) was issued in 2014 and it will repeal current PED (97/23/EC) on 19.7.2016. The objective of the Directive is to unify rules and standards of Pressure Equipment design (development), manufacture and placing on the European market.

The Technical Regulations of the Customs Union have been developed with due consideration both of the existing practice, long-term experience and the existing standards and the European Directive. TR CU 032/2013 came into force in February 2014.

Structurally, the TR CU 032/2013 and the New Directive 2014/68/EU are similar documents, but there are some major and minor differences between them. Those differences will be discovered in the following table (Table 1) which is created according to DIRECTIVE 2014/68/EU and TP TC 032/2013 texts and a personal interview with T. STARK (2016).

TABLE 1. Comparison of New PED 2014/68/EU and TR CU 032/2013

TR CU 032/2013	**PED 2014/68/EU**
Apply	
High pressure equipment with a maximum allowable operating pressure above **0,05 MPa**	Pressure equipment and assemblies with a maximum allowable pressure PS greater than **0,5 bar**
Not apply	
Listing products on which requirement does not apply	Listing products contain references to other directive which covered this product. Ex: Simple pressure vessels covered by Directive 2014/29/EU

Common definitions	
Person authorized by the manufacturer - a legal entity or natural person registered as a sole proprietor in the territory of the Customs Union and Common Economic Space in accordance with the legislation of the member state, carrying out functions of the foreign manufacturer under a contract therewith in terms of ensuring compliance of the equipment with the requirements of this technical regulation in terms of responsibility for non-compliance of equipment with the requirements hereof;	**Authorized representative** - means any natural or legal person established within the Union who has received a written mandate from a manufacturer to act on his behalf in relation to specified tasks;
Manufacturer - a legal entity or natural person registered as a sole proprietor, which carry out manufacturing or production and sale of equipment on their own behalf and responsible for its compliance with safety requirements of this technical regulation;	**Manufacturer** - means any natural or legal person who manufactures pressure equipment or an assembly or has such equipment or assembly designed or manufactured, and markets that pressure equipment or assembly under his name or trademark or uses it for his own purposes.
Nominal diameter - a numerical designation of size equal to the rounded value of the inner diameter that is specified for all components of the equipment other than components indicated by outside diameter or thread size. Nominal diameter and nominal inside diameter are measured in millimetres without indication of dimension;	**Nominal size (DN)** - means a numerical designation of size which is common to all components in a piping system other than components indicated by outside diameters or by thread size; it is a convenient round number for reference purposes and is only loosely related to manufacturing dimensions; the nominal size is designated by DN followed by a number;
Vessel - a hermetically closed container (fixed installed or mobile), intended for conducting chemical, thermal and other processes, as well as for storage and transport of gaseous, liquid and other substances.	**Vessel** - means a housing designed and built to contain fluids under pressure including its direct attachments up to the coupling point connecting it to other equipment; a vessel may be composed of more than one chamber.
In TR there is no definition for maximum /minimum **allowable temperature**, but three other definitions which mean the same: ▪ temperature of working medium; ▪ allowable wall temperature; ▪ estimated wall temperature;	Maximum/minimum **allowable temperature TS**

The **permitted pressure** definition can be similar to PED. The other definitions are completed the previous one: ▪ nominal pressure; ▪ operating pressure; ▪ design pressure; ▪ internal pressure; ▪ test pressure;	Maximum **allowable pressure PS**
Other definitions	
Assigned life, assigned service life capacity, cylinder, pressure chamber, barrel, commissioning, design service life, equipment identification, intended use, life cycle, limited condition of the equipment, maintenance of equipment, mass production, piece of equipment, repair of equipment, safety case, tank, working mediums group, electrically heated boiler, electrode boiler, hot water boiler, industrial power boiler, steam boiler, waste heat boiler.	Accreditation, assemblies, CE marking , conformity assessment , conformity assessment body, distributor , economic operators , European approval for materials, fluids , harmonized standard, importer , making available on the market , national accreditation body , permanent joints , piping, placing on the market , pressure accessories, pressure equipment, putting into service, recall , technical specification, Union harmonization legislation, volume (V), withdrawal.
Category of equipment	
Pressure equipment is classified into four categories: ▪ 1st category ▪ 2nd category ▪ 3rd category ▪ 4th category Requirements are presented in the form of tables.	Pressure equipment is classified into five categories: ▪ SEP (Sound Engineering Practice) ▪ Category I ▪ Category II ▪ Category III ▪ Category IV Requirements are presented in the form of charts.
Determine the hazard category	
Ex. 1: Different category determination Vessels with the operating environment - liquids of group 2, volume from 0.0001 to 0,01 m3 (excluding the impact of the rated temperature), max. pressure more than 100 MPa - **Category 2.**	Category for vessels the operating environment - liquids of group 2, volume 0,1 to 10 liters (excluding the impact of the rated temperature), max. pressure over 1000 bar - **Category I.**
Ex.2: Different requirements for equipment Pipelines with the operating environment –	Piping with the operating environment – liq-

liquids of group 1, for Category 1 required: DN more than 25 mm, max. pressure from 8 to 50 MPa , with the **PS*DN more than 350 MPa*mm.** **Ex.3:** (Fire) Heated pressure for Category 4 required: ▪ volume from **0.002 to 0,01 m3**, max. pressure than 3,2 MPa; ▪ volume from **0.01 to 1 m3**, max. pressure than 100 MPa, with the **PS*V more then 0,3 MPa*m3.**	uids of group 1, for Category 1 required: DN more than 25 mm, max. pressure from 80 to 500 bar. (Fire) Heated pressure for Category 4 required: ▪ volume from **2 to 100 liters**, max. pressure than 32 bar;
Conformity assessment procedure	
Conformity assessment is carried out by: ▪ Certification of conformity (3 and 4 categories) ▪ Declaration of conformity (1 and 2 categories) according to the **schemes** established by technical regulation. The **validity** of Declaration and Certification can be up to 5 years or not determined, depends on scheme.	Conformity assessment is carried out by ▪ Declaration of Conformity /Manufacturer Declaration according to the **modules** established by PED. (Applies for I-IV categories.) ▪ Certification of conformity when the third party is involved, depends on the module (III and IV categories) Declarations don't have action date.
Applier for certification (declaration) TR CU 032/2013 can be the only company, which is officially registered in the territory of Customs Union (Russia, Belorussia, Kazakhstan) and which has contract with representative of foreign manufacture in the case of conformity of equipment to requirements of TR CU. The applicant prepares a set of documents, referred to in paragraph 45. **Certification body** selects the applicant's samples to perform tests, analyses the production of the manufacturer and conducts inspection control of certified equipment.	**Manufacturer** has to make conformity assessment according to applicable module and has to make technical documentation required by module, referred to in Annex III. **Distributor** checks that conformity assessment is done right by manufacturer Distributor is kept as manufacturer in eyes of PED and it has all the same responsibilities. **Notified Body** will undertake the assessment of the product and the manufacturer's quality system.
One set of documents for each scheme.	Every module has its' own set of documents which need to be prepared for conformity assessment procedure.

Marking	
It is applied to each piece of equipment in any way. EAC	It is not necessary to be affixed to each individual item of equipment. The CE marking shall be followed by the identification number of the notified body, where that body is involved in the production control phase. **SEP** it's not allowed to apply CE mark. CE 0086

4 COMPANY CASE

The topic of the thesis was based on case companies needs to prepare for next possible future project in Russia. Based on thesis material the quality department will know what kind of documents they need to prepare and what kind of job needs to be done according to the new 2014 updated requirements.

4.1 Updating needs.

During the material searching I met people who had worked in Russian project early and interviewed them. After that I collected all information together and got a clear view of the case company needs. The first and the most important need is that the company didn't have clear information (instruction) what they need to do for project and with coming new regulation. In an earlier project in Russia or Belarus the company worked with GOST standards, but after 01.02.2014 when the technical regulations of customs union for equipment working under excess pressure came into force the situation has changed. The other need was with technical passports. (E. PALTMANN, 2016; J. LIND, 2016; P. VARNESLAHTI, 2016)

The aim of my work was to help the company in future projects to prepare the necessary documents in time and to have good communication with Russian authorities. Also I will make training material for the Quality Department to help them in possible future projects in Russia.

4.2 When and how the standard requirements were changed

The environmental legislation has rapidly expanded since the mid 1990s and nowadays it comprises more than 30 federal laws (as compared to only six laws/codes that existed in the early 1990s), and about 200 regulations. Standards and technical norms are scattered across another 800 documents. Many of these documents had been prolonged or amended many times, and a significant part of them is obsolete. The development of new laws and regulations in order to close loopholes and to address new problems resulted in a loss of simplicity and ability to understand what compliance with rules involves. Some norms are unfeasible thus impeding compliance. (OECD, Environmental Policy and Regulation in RUSSIA, 2006)

The adoption in 2002 of a new Federal Law on Technical Regulation marks a turning point in the development of the regulatory framework. The law promotes a major review of around 60 000 norms and regulations concerning environmental, health, safety and other issues. Many norms that were previously mandatory will become voluntary, while others will be scrapped altogether. Moreover, the law outlines new procedures for proposing, evaluating and adopting new standards and regulations. If implemented in full and adequately, these procedures will make the regulatory process more predictable, transparent and inclusive, facilitating widespread consultation and full assessment of the potential economic impact of new regulations. (OECD, Environmental Policy and Regulation in RUSSIA, 2006)

Since February 2012 the technical regulations of the Customs Union have come into force one by one and replacing the technical regulations of the Russian Federation and Russian standards.

Nowadays the 34 from 47 technical regulations of the CU were approved. Other new Technical Regulations are undergoing inter-state discussions and should be approved in the near future. The list of technical regulation which was approved you can check in the following link: http://www.eurasiancommission.org/en/act/texnreg/deptexreg/tr/Pages/TRVsily.aspx

4.2.1 Reason for change

The project targeted the field of the Russian technical regulation system which is currently undergoing significant changes due to the establishment of the Customs Union of the Russian Federation, the Republic of Belarus and the Republic of Kazakhstan and the replacement of national technical regulations by the Customs Union's legislation. The project developed a set of recommendations for drafting and implementation of the Customs Union's technical regulations in the following fields: high pressure equipment, medical devices, energy efficiency, construction, chemicals, machinery, low voltage equipment, electro-magnetic compatibility, food safety, toys and packaging. The aim of the recommendations is to approximate the Customs Union's technical regulations and European directives to ease the trade relations between European and Russian manufacturers. The project also generated measures to strengthen the current Russian system of standardization, market surveillance, conformity assessment and accreditation so that they better serve the production and placement on the Customs Union's market of safe, high quality, innovative products at a reasonable price. (EEAS. EU-Russia technical regulation systems, 2016)

Every type of product is subject to regulation of multiple state standards. National standards taken as a basis for technical regulation and can also be used in part or in its entirety. Appointment of Technical Regulations is to combine all of these multiple requirements in a single document, and in the most generalized form.

4.2.2 Difference between GOST R and TR CU

Main changes in Russian regulations

On February 1, 2014 the new Technical Regulation of Customs Union for the safety equipment, working under excess pressure (TR CU 032/2013) was enforced in Russia, Belarus and Kazakhstan.

There is a number of changes for manufacturers in new technical regulations compare to GOST R. The most important changes are:

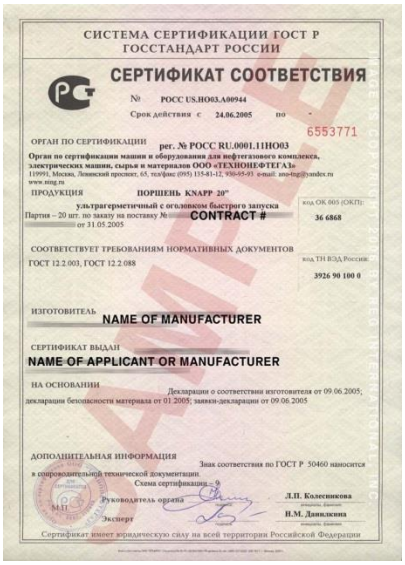
1. The GOST is characterized by quantitative parameters of the products, and the TR CU - the conditions of use of the finished product. Thus, in the present technical regulations it

is a normative act to mandatory implementation, in contrast to the state standards, which is now voluntary.

2. Manufacturers need a local representative. With GOST, this was not required.

3. Certificates and declaration will be valid in all the countries of Customs Union: Russia, Belarus and Kazakhstan. GOST is only valid within the Russian Federation**.**

    - A document issued by the rules of a certification system confirms compliance equipment to technical regulations, instead of the previously existing standards. GOST R-for Russia, GOST K- for Kazakhstan, STB- for Belarus are not issued any longer. Earlier issued GOST R certificates were valid until March 15, 2015. After that, the new EAC mark must be used.
    - The appearances of the certificate, its colors and fill patterns and of course, the number of mandatory application were changed.


СИСТЕМА СЕРТИФИКАЦИИ ГОСТ Р
ГОССТАНДАРТ РОССИИ

СЕРТИФИКАТ СООТВЕТСТВИЯ

№ РОСС US.НО03.А00944

Срок действия с 24.06.2005 по

6553771

ОРГАН ПО СЕРТИФИКАЦИИ рег. № РОСС RU.0001.11НО03

ПРОДУКЦИЯ ПОРШЕНЬ KNAPP 20"

ультрагерметичный с оголовком быстрого запуска

Партия – 20 шт. по заказу на поставку № CONTRACT # от 31.05.2005

код ОК 005 (ОКП): 36 6868

СООТВЕТСТВУЕТ ТРЕБОВАНИЯМ НОРМАТИВНЫХ ДОКУМЕНТОВ

ГОСТ 12.2.003, ГОСТ 12.2.088

код ТН ВЭД России: 3926 90 100 0

ИЗГОТОВИТЕЛЬ NAME OF MANUFACTURER

СЕРТИФИКАТ ВЫДАН NAME OF APPLICANT OR MANUFACTURER

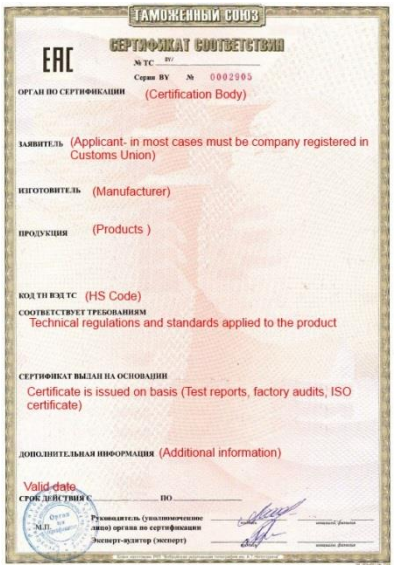
НА ОСНОВАНИИ Декларации о соответствии изготовителя от 09.06.2005; декларации безопасности материала от 01.2005; заявки-декларации от 09.06.2005

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ Знак соответствия по ГОСТ Р 50460 наносится в сопроводительной технической документации. Схема сертификации – 9

Руководитель органа Л.П. Колесникова

Эксперт И.М. Данилкина

Сертификат имеет юридическую силу на всей территории Российской Федерации


ТАМОЖЕННЫЙ СОЮЗ

EAC СЕРТИФИКАТ СООТВЕТСТВИЯ

№ ТС BY

Серия BY № 0002905

ОРГАН ПО СЕРТИФИКАЦИИ (Certification Body)

ЗАЯВИТЕЛЬ (Applicant- in most cases must be company registered in Customs Union)

ИЗГОТОВИТЕЛЬ (Manufacturer)

ПРОДУКЦИЯ (Products)

КОД ТН ВЭД ТС (HS Code)

СООТВЕТСТВУЕТ ТРЕБОВАНИЯМ

Technical regulations and standards applied to the product

СЕРТИФИКАТ ВЫДАН НА ОСНОВАНИИ

Certificate is issued on basis (Test reports, factory audits, ISO certificate)

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ (Additional information)

Valid date

СРОК ДЕЙСТВИЯ С ПО

М.П. Руководитель (уполномоченное лицо) органа по сертификации

Эксперт-аудитор (эксперт)

IMAGE 1. Old certificate(GOST R, 2016) IMAGE 2. New certificate (CU Certification, 2015)

    - The period of issue was changed, namely the validity of the certificate has now become 5 years instead of the previous three years, as it was before when GOST R certificates of conformity was issued.

4. Earlier for the GOST R "Permit for Use" was obligatory to get, before any other certificates, but since January 1, 2014 issuance of permit was cancelled.

5. Mandatory factory audits are performed by a Russian certification body. With GOST, a test lab could do this.

6. The Russian GOST R and GOST-TR mark has been replaced by the EAC mark.

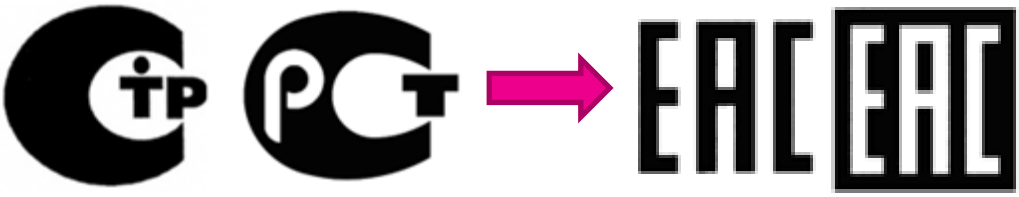


IMAGE 3. GOST R mark (CU Certification, 2015) IMAGE 4. EAC mark (CU Certification, 2015)

7. An annual fee is charged to the manufacturer (starting from the second year)

8. With TR CU an initial factory inspection report is needed, with a yearly update

9. A Russian user manual or product brochure is required

4.3 Information about avoiding risks

Over the past years Russian Federation has made significant progress in developing market infra-structure and in modernization of Russian standards system. Russia is one of the fastest growing export markets after Europe and North America. Opportunities for business are increasing, however there are requirements that must be met in order to supply goods and services to Russia.

This thesis material will provide a process guide to what need to know about the conformity assess-ment in Russia and the territory of the Customs Union.

It is necessary to take into account demands of Russian Rules during the very beginning of design of the equipment, in order to avoid problems after its manufacturing.
It is always easier to fix all the mismatches during the project development. Of course there is often an opportunity to make special researches and examinations to prove that the applied materials or the design can be used in the territory of Russian Federation or the governments of Customs Union, but it takes a lot of time and money, because all researches must be made by qualified specialists and in accordance with the national Laws. For example, imagine how much effort it will take to change the nameplates on the equipment, which is already packed and shipped (and this is really one of the smallest problems one can meet).

Prior to equipment delivery to the territory of the Customs Union it is necessary to determine the mandatory technical requirements for these products and the method of conformity assessment:

- Industrial safety expertise with registration in Rostechnadzor
- Certification
- Declaration
- Expert assessment

or a combination of the above mentioned methods.

Be aware that different Technical Regulations provide different methods and conformity assessment schemes for the same equipment (for example, heat exchangers for petrochemical application fall within the requirements of CU TR 010 and CU TR 032). It is a result of the fact that technical regulations establish only the minimal requirements to ensure different types of safety (ensuring the elimination of risks of different physical nature). In this case, confirmation must be made according to all prescribed regulations and schemes.

In general the confirmation is provided for:

- the batch of equipment
- single product

Each technical regulations set the scope of use, basic concepts, safety requirements, forms and schemes of conformity certification applicable within the technical regulation. Also for the majority of CU technical regulations the lists of products are developed in respect of which the submission of the customs declaration is accompanied by submitting to the customs authority of the evaluation (confirmation) of compliance with the requirements of TR CU. They detail the scope of use specified in the Technical Regulations of the Customs Union, contain the names of goods, HS codes of CU, name of the required document for confirming the compliance (certificate or declaration). The same products may be subject to several CU technical regulations. (Custom Union Certification and Declaration. Custom Union Declaration – EAC, 2015)

For the Pulp & Paper Industry the following technical regulations are required:

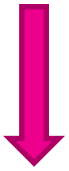
- TR CU 010/2011 Technical Regulations of Customs Union On safety of machinery and equipment
- TR CU 032/2013 Technical Regulations of Customs Union On safety of equipment working under pressure
- TR CU 016/2011 Technical Regulations of Customs Union On safety of devices operating on the gaseous fuel
- TR CU 004/2011 Technical Regulations of Customs Union On safety of low voltage equipment
- TR CU 020/2011 Technical Regulations of Customs Union Hardware electromagnetic capability and others.

In this thesis the process guide will be given only for TR CU 032/2013 because it is the most important technical regulation for the case company.

4.3.1 A process guide to the TR CU 032/2013

In order to fulfill the TR CU 032/2013 we need to follow many different steps. The first of all the TR CU 032/2013 requires the level of hazard of pressure equipment to be assessed and classified into 1 of 4 categories.

- 1st category
- 2nd category
- 3rd category
- 4th category



Increasing level of hazard

The higher the level of hazard, the more extensive the level of quality assurance required during the design, manufacture and testing of the equipment.

It is generally the process engineer's responsibility to determine the hazard category of each particular equipment item and system.

In order to classify pressure equipment correctly, the process engineer must follow the steps in the TR. This step is summarized in the tables (charts) at the end of this guide.

The classification has 6 steps:

1. Determine the type of pressure equipment
2. Determine the state of the fluid in the equipment
3. Determine the working medium group of the fluid in the equipment
4. Select the appropriate table (chart) according to date
5. Determine the maximum allowable pressure and the defining dimension of the equipment (V, DN)
6. Determine the category

The **first step** in determining the category of a particular piece of equipment is to select the appropriate equipment type from the list.

<u>Types of Pressure Equipment</u>

The TR CU 032/2013 defines 8 types of pressure equipment:

1. Vessel
2. Boilers
3. Pipelines
4. Valves
5. pressure-resistant items of equipment (assembly units) and accessories
6. Safety devices and equipment
7. Indicating and safety devices
8. Pressure chambers (except for single medical pressure chambers)

Definitions of each equipment type are given in technical regulation:
"vessel" - a hermetically closed container (fixed installed or mobile), intended for conducting chemical, thermal and other processes, as well as for storage and transport of gaseous, liquid and other substances;
"waste heat boiler" - a device, wherein the combustible gases or other process streams are used as a heat source;
"industrial power boiler" - steam or hot water boiler (including soda recovery boiler), the furnace of which is used for the processing of technological materials;
"electrode boiler" - steam or hot water boiler, where the heat generated by the flow of electric current through water is used;
"electrically heated boiler" - steam or hot water boiler, where the heat generated by electric heating elements is used;
"hot water boiler" - a device designed to heat water under pressure, which is greater than atmospheric, and used as a coolant outside of this device;
"steam boiler" - a device designed to generate steam at a pressure above atmospheric pressure, used outside the device;
"pressure chamber" - a vessel in which a decreased and (or) increased pressure is created, which is equipped with devices and equipment and can accommodate people;
"safety devices" - devices designed to protect vessels, boilers, piping from destruction when exceeding the allowable pressure or temperature values;
"items of equipment" - an assembly unit of equipment designed to perform one of its basic functions.

TR CU 032/2013 didn't give definition for pipelines and valve, but for better understanding the following definition is given (Definitions according to DIRECTIVE 2014/68/EU):
"Piping" means piping components intended for the transport of fluids, when connected together for integration into a pressure system; piping includes in particular a pipe or system of pipes, tubing, fittings, expansion joints, hoses, or other pressure-bearing components as appropriate; heat exchangers consisting of pipes for the purpose of cooling or heating air shall be considered as piping;
"Pressure accessories" means devices with an operational function and having pressure-bearing housings; Examples of pressure assemblies include **valves**, pressure regulators, pressure gauges and filters.

The **second step** is to establish whether the fluid contained within the equipment is gas or liquid. The following definition for gas and liquid is given according to DIRECTIVE 2014/68/EU:

Gas

Gases include gases, liquefied gases, gases dissolved under pressure, vapours and also those liquids whose vapour pressure at the maximum allowable temperature is greater than 0,5 bar (0,05 MPa) above normal atmospheric pressure.

Liquid

Liquids include liquids having a vapour pressure at the maximum allowable temperature of not more than 0,5 bar (0,05 MPa) above normal atmospheric pressure.

The **third step** is to decide whether the fluid contained within the equipment is classified as a working medium Group 1 or a working medium Group 2.

Group 1 includes working medium consisting of

- combustible,
- oxidizable,
- flammable,
- explosive,
- toxic and highly toxic gases,
- liquids and vapors in the single-phase state,
- mixtures thereof;

Group 2 which includes all other work mediums that are not assigned to group 1;

Once the equipment type, fluid state and working medium group have been determined, the appropriate classification table can be selected. This represents the **fourth step** in determining the TR CU 032/2013 category.

There are 9 separate classification tables, one for each of the possible combinations of equipment type, fluid state and fluid group.

TABLE 2. Classification equipment

Equipment Type	Fluid State	Working medium Group	Table
Vessels	Gas	1	1
Vessels	Gas	2	2
Vessels	Liquid	1	3
Vessels	Liquid	2	4
Boiler	N/A	N/A	5
Pipelines	Gas	1	6
Pipelines	Gas	2	7
Pipelines	Liquid	1	8
Pipelines	Liquid	2	9

The tables with classification of equipment by categories of hazards you can find in Appendix 3 or in TP TC 032/2013, Appendix 1.

The **fifth step** is to determine the maximum allowable pressure and defining dimension of the equipment.

"Permitted pressure" - the maximum allowable excess pressure for the equipment (element), determined on the basis of conformity assessment and (or) control durability calculation;
The defining dimension of the equipment is dependent on the equipment type.
For vessels and boilers, the defining dimension is the equipment volume expressed in m^3.
For pipelines, the defining dimension is the nominal size of the components comprising the piping system expressed in millimeters. Typically this is the nominal pipe diameter DN.

The **sixth** and **final step** is to read off the TR CU 032/2013 category from the appropriate table using the relevant values of maximum allowable pressure and defining dimension.

Example:
Determine the category of a 50m3 horizontal storage vessel containing propane with a maximum allowable pressure of 10 MPa (100 bar) and a maximum allowable temperature of 75C.

Step 1: The equipment type is a **VESSEL**.

Step 2: Propane at the maximum allowable temperature of 75C has a vapour pressure greater than 0.05 MPa above normal atmospheric pressure. So the state of the fluid in the equipment is classed as **GAS**.

Step 3: Propane is classified as "extremely flammable" and is therefore a **GROUP 1** fluid.

Step 4: The appropriate hazard category table is **TABLE 1**. This is the table for a vessel containing a Group 1 gas.

Step 5: The maximum allowable pressure of the vessel is 10 MPa.
The defining dimension of a vessel is volume. The volume of the vessel is 50m3

Step 6: V = 50m3, P = 10 MPa, P*V= 500 MPa*m3

TABLE 3. Example table for determine the category of vessel for gas used for working mediums group 1

Equipment category	Equipment capacity (m^3)	The product of the maximum allowable operating pressure and capacity values (MPa * m^3)	Maximum allowable operating pressure (MPa)
1st	more than 0.001	more than 0.0025, up to 0.005, inclusive	more than 0.05
2nd	more than 0.001	more than 0.005, up to 0.02, inclusive	more than 0.05
3rd	more than 0.0001, up to 0.001, inclusive	not standardized	more than 20, up to 100, inclusive
	more than 0.001	more than 0.02, up to 0.1, inclusive	more than 0.05
4th	more than 0.0001, up to 0.001, inclusive	not standardized	more than 100
	more than 0.001	more than 0.1	more than 0.05

Result: The required category for the equipment is 4th category.

CONFORMITY ASSESSMENT

When the category has been established for equipment, the conformity assessment requirements can be defined. In effect, the conformity assessment is the quality assurance required to validate the design, manufacture, testing and inspection of the equipment.

The conformity assessment with the requirements of this technical regulation is carried out by:

- **Certification of Conformity** by an accredited certification body included in the Unified Register of certification bodies and testing laboratories (centres) of the Customs Union
- **Declaration of Conformity** based on own evidence, and (or) evidence obtained with the participation of the certification body or an accredited testing laboratory (centre) included in the Unified Register of certification bodies and testing laboratories (centres) of the Customs Union (hereinafter - accredited testing laboratory).

TABLE 4. Conformity assessment

Category	Type of conformity
1	Declaration
2	Declaration
3	Certification
4	Certification

Conformity assessment is carried out according to the certification and declaration schemes established by this technical regulation.

TABLE 5. Declaration schemes

№ schemes	purpose	schemes elements		
		set of documents	**tests of samples**	**inspection control**
1d	serial(mass) production equipment of the 1st and 2nd categories	by applicant (paragraph 45)	by applicant in a testing laboratory or accredited testing laboratory	applicant carries out production control
2d	batch the equipment (single product) of the 1st and 2nd categories	by applicant (paragraph 45)	by applicant in a testing laboratory or accredited testing laboratory	-
3d	serial(mass) production pieces of equipment and equipment components of the 1st and 2nd categories	by applicant (paragraph 45)	by applicant in an accredited testing laboratory	applicant carries out production control
4d	batch of equipment pieces of the 1st and 2nd categories and equipment components of the 1st and 2nd categories	by applicant (paragraph 45)	by applicant in an accredited testing laboratory	-
5d	equipment of the 1-4 categories* (on site)	by applicant (paragraph 45)	certification body is conducting the equipment type assessment**	applicant carries out production control

* Applies in next cases:

- testing cannot be carried out to the full extent prior to the installation of equipment on site;
- the standards referred to in paragraph 36 of this technical regulation have not been applied in the development (design) and manufacturing (production) of equipment;

** Depending on the documents submitted by the applicant, the equipment type assessment is carried out using one of the following methods:

- assessment of the sample which represents all subsequently produced equipment;
- examination of the submitted documents, testing the sample or core (critical) components of the equipment;
- registration and issuance of certificate for equipment type in accordance with the unified form, approved by the decision of the Eurasian Economic Commission, to the applicant by the certification body subject to positive results of the equipment type assessment.

TABLE 6. Certification schemes

№ schemes	**purpose**	**schemes elements**				
		set of documents	**select the samples**	**tests of samples**	**assessment of production**	**inspection control**
1c	serial (mass) production equipment	by applicant (parag. 45) + applies for the certification	certification body	accredited testing laboratory	analyzes the production of the manufacturer by certification body	control of certified equipment by certification body
3c	batch the equipment	by applicant (parag. 45) + applies for the certification	certification body or accredited testing laboratory	accredited testing laboratory	-	-
4c	single product	by applicant (parag. 45) + applies for the certification*	-	accredited testing laboratory	-	-
7c	batch and mass production***	by applicant (parag. 45) + applies for the certification	-	certification body **	analyzes the production of the applicant by certification body	-

* The application that should contain the identifying characteristics of a single product, then the certification body should notify the applicant about the decision on application containing the conditions of certification;

** Certification body is conducting the equipment type assessment using one of the following methods:

- equipment sample assessment for the planned manufacturing of the standard model of all future products;
- analysis of technical documentation, the tests of sample equipment or major components.

***As well as in the case of planning modifications to the equipment

NOTE: For company case the schemes 2d, 4d, 5d, 3c, 4c will be use.

In order to fulfill the conformity assessment you need to prepare the next documentations:

- Set of documents for conformity (paragraph 45 in TR CU 032/2013)
  - Technical documentation accompanying the equipment
  - Equipment passports:
    - Pipelin
    - Boiler
    - Vessel
    - Cylinder
    - Valve (pipes fittings)
  - Operating manual (guide)

Set of documents (paragraph 45)

When conducting conformity assessment applicant prepares a set of documents for the equipment, which includes:

a) safety case;
b) passport of equipment;
c) operating manual (guide);
d) project documentation;
e) the results of strength calculations and calculations of throughput capacity of safety devices (if any, in accordance with the project);
f) technological regulations and information about the technological process (data on the materials used, semi-finished products, components, welding materials, the methods and parameters of welding and heat treatment, methods and results of non-destructive testing);
g) information about the conducted tests (measurements);
h) test report (protocol) of equipment testing, carried out by the manufacturer, a person authorized by the manufacturer and (or) accredited testing laboratory;
i) document confirming the characteristics of materials and components (if any);
j) certificates of conformity, declaration of conformity or test reports for materials, components (if any);
k) list of the standards referred to in Section V of technical regulation, which were used in the manufacture (production) of equipment (if they are used by the manufacturer);
l) documents which is proof of qualifications for specialists and personnel of the manufacturer;
m) other documents directly or indirectly confirming that the equipment complies with the requirements hereof (subject to availability).

Technical documentation

There are the requirements for content and completeness of technical documentation, which must be transferred to the customer together with the equipment. Thus, for equipment which falls within the requirements of TR CU 032/2013, the technical documentation enclosed to the equipment should include:

a) technical passport;
b) copy of the safety approval;

c) general view drawings;
d) passports of safety devises (if they are in accordance with the design documentation);
e) calculation of the carrying capacity of safety devices (if they are in accordance with the design documentation);
f) strength calculation of the equipment (made in accordance with Russian standards); operation manual;
g) drawings, schemes, calculations and other documentation in accordance with supply contract. The form and content of these documents are strictly regulated, either by Regulations or by the relevant Industrial safety Rules and norms. All documentation must be submitted in Russian.

The pipeline passport includes:

a) name and address of the owner;
b) purpose;
c) date of manufacture (production);
d) working medium;
e) operating parameters of the working medium: pressure, MPa (kgf/cm2), temperature, °C;
f) design service life;
g) design life;
h) estimated frequency of starting;
i) diagrams, drawings, certificates and other documents for manufacturing (production) and the installation of the pipeline.

Boiler passport includes (scope of information is determined by the manufacturer depending on the type of boiler):

a) general information:
   - name and address of the manufacturer;
   - date of manufacture (production);
   - type (model);
   - name and purpose;
   - serial number;
   - design service life;
   - design life of the boiler and main components;
   - estimated frequency of starting;
   - geometrical dimensions of the boiler and its elements;
b) technical characteristics and parameters:
   - calculated fuel type and its calorific value, MJ/kg (kcal/kg);
   - fuel consumption, m3/h (t/h);
   - type and characteristics of the furnace installation (burners);
   - design, operation, test pressure, MPa (kgf/cm2);
   - maximum allowable hydraulic resistance of the boiler at nominal capacity, MPa

(kgf/cm2);

- minimum allowable pressure at nominal temperature, MPa (kgf/cm2);
- nominal steam temperature at the boiler outlet, °C;
- estimated temperature of the superheated steam (liquid), °C;
- nominal fluid temperature at the boiler inlet, °C;
- nominal and maximum fluid temperature at the boiler outlet, °C;
- nominal, minimum and maximum allowable evaporation capacity, t/h;
- nominal, minimum and maximum heat capacity, kW;
- heating surface of the boiler and main parts, m2;
- capacity, m3;
- minimum and maximum allowable fluid flow rate, m3/h;

c) information about safety devices (including the type, quantity, location of installation, cross sectional area, nominal diameter, vapor or liquid flow coefficient, the value (range) of the set pressure);

d) information about the fluid (water) level indicator (including the indicator type, quantity, location of the installation);

e) information about the main valves (including the quantity, nominal diameter, rated pressure, operating parameters, body material, installation location);

f) information about the main equipment for measurement, control, signaling, regulating and automatic protection (including the quantity, type (brand));

g) information about the pumps (including the type, quantity, operating parameters, drive type);

h) information about the basic elements of the boiler manufactured (made) from sheet steel (including the quantity, size, material, welding and heat treatment);

i) information about the elements of the boiler manufactured (made) from pipes (including the quantity, size, material, welding and heat treatment);

j) information about the fittings, lids, bottoms, reducers, flanges (including the quantity, size, material);

k) information about the coolant (including the name, the maximum allowable operating temperature, self-ignition temperature in an open space, solidification temperature, boiling temperature, the change (curve) of the boiling temperature depending on the pressure, other data affecting the safe operation);

l) images, diagrams, drawings of the boiler and its essential elements and other documents (summary sheet of manufactory changes, packing list, the specification with basic dimensions of assembly units, etc.);

m) other information to ensure safe operation of the boiler.

The vessel passport includes:

a) general information:

- name and address of the manufacturer;
- date of manufacture (production);
- serial number;

- design service life;

b) information about the technical characteristics and parameters:
   - operation, design, test pressure, MPa (kgf/cm2);
   - operating temperature of working medium, °C;
   - design wall temperature, °C;
   - minimum allowable negative wall temperature, °C;
   - name of the working medium;
   - group of the work medium;
   - corrosion (erosion) allowance, mm;
   - capacity, m3;
   - weight of the empty vessel, kg;
   - maximum weight of filled medium kg;
c) information about the main parts (including the quantity, sizes, material, welding (soldering));
d) information about fittings, flanges, lids, fasteners (including the quantity, sizes, material);
e) information about the safety devices, main valve, measuring devices, security devices (including the quantity, nominal diameter, design pressure, body material, installation location);
f) images, diagrams, drawings of the vessel and other documents (summary sheet of factory changes, packing list, the specification with basic dimensions of assembly units, etc.);
g) other information to ensure safe operation of the vessel.

The cylinder passport includes:

a) general information:
   - name and address of the manufacturer;
   - date of manufacture (production);
   - the designation of the cylinder;
   - medium for which the cylinder was designed;
   - serial number;
b) information about the technical characteristics and parameters:
   - operating pressure, MPa (kgf/cm2);
   - test pressure, MPa (kgf/cm2);
   - the main dimensions of the cylinder, the drawing of the cylinder;
   - capacity, l;
   - weight, kg;
   - thread on the neck;
   - neck sealing;
   - operating temperature range, °C;
   - the maximum number of refills;
   - the estimated service life from the date of manufacture (production), in years;
c) requirements for transportation and storage of the cylinder;
d) requirements for the installation of the cylinder;

e) requirements for the use of the cylinder;
f) other information to ensure safe operation of the cylinder.

The valve (pipes fittings) passport includes:

a) general information:
   - name and address of the manufacturer;
   - date of manufacture (production);
   - name, designation and identification (serial) number;
   - the purpose of valve(pipes fittings);
   - information on conformity assessment;
b) information about the technical parameters:
   - nominal diameter (DN);
   - nominal pressure(PN) or operating pressure(Pp),MPa(kgf /cm^2);
   - working medium;
   - temperature of working medium, °C;
   - gate sealability;
   - climatic modification and environmental parameters;
   - type of connection to the pipeline;
   - hydraulic characteristics (drag coefficient, or nominal capacity or flow coefficient);
   - resistance to external influences (if this information need to be specified);
   - weight, kg;
   - indicators of reliability;
   - safety indicators;
   - type of the drive and its main technical characteristics;
c) information about the materials of main components;
d) other information to ensure safe operation of the boiler.

Operating manual (guide) includes:

a) information on the design, principle of operation, characteristics (properties) of the equipment;
b) instructions for installation or assembly, setup or adjustment, maintenance and repair of equipment;
c) instructions for use of equipment and safety measures that must be taken when using the equipment (including commissioning, proper use and maintenance, all types of repair, periodic diagnostics, testing, transportation, packaging, preservation and storage conditions);
d) assigned indicators (assigned storage time, specified service life and (or) assigned service life) depending on the design features.

   Upon expiration of assigned indicators (assigned storage time, specified service life and (or) assigned service life), specified in the operating manual (guide), the equipment shall be no longer operated and should be sent for repair, or disposal or for verification and determination of new assigned indicators (assigned service life, storage time);
e) list of critical failures, possible false operations which lead to an incident or accident;

f) personnel actions in the event of an incident, accident or critical failure;
g) criteria of limiting states;
h) instructions for decommissioning and disposal;
i) information about personnel qualifications;
j) name, location and contact information of the manufacturer (person authorized by the manufacturer), importer.

NOTE! Applicant for certification

An applicant can only be registered in the territory of the Customs Union juridical person or private person as an individual entrepreneur, either the manufacturer or the person executing functions of the foreign manufacturer on the basis of the contract with him, in part of ensuring of compliance of the supplied products to the requirements of CU TR and in part of the responsibility for non-compliance of delivered product to the requirements of CU TR (person performing the functions of the foreign manufacturer).

When it is fully proved that product meets all requirements and standards prescribed in the relevant technical regulations the product is being registered in Unified Register and TR CU Declaration of Conformity or Certification of Conformity are issued.
They are the only document that confirms conformity of the equipment with the requirements hereof.

An example of certification and declaration of conformity you can find in Appendix 1 and Appendix 2 as an attachment to this thesis work.

Marking

Equipment that meets the requirements and have undergone conformity assessment shall have the single market circulation mark for the member states of the Customs Union.

Thus, for equipment which fall within the requirements of TR CU 032/2013, the marking shall contain the following information:

a) name and (or) the designation of the type, brand, model of the equipment;
b) characteristics and conditions which influence on safety;
c) material, which the equipment (elements) is made from;
d) manufacturer's trademark (if there is);
e) manufacturing number;
f) date of manufacturing.

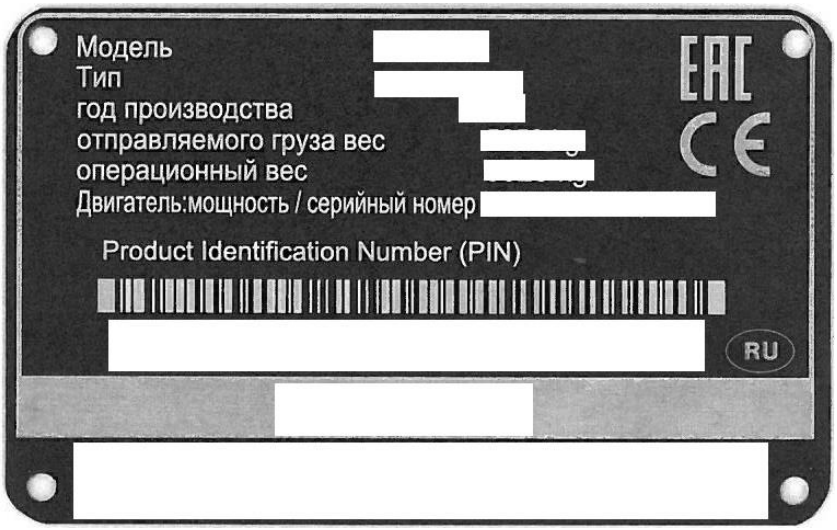


IMAGE 5. Example name plate of product with EAC mark

Moreover the equipment, which has passed the conformity to Technical Regulations, must be marked with the unique sign of product circulation on the market of governments' members of the Customs Union. According to TP TC 032/2013 the unique sign of product circulation on the market of governments members of the Customs Union must be put on every unit of the equipment in any way, which guarantees the clear and readable image during the full service lifetime of the equipment, and also it is must be presented in the operation documentation which is enclosed to the equipment.

EAC

IMAGE 6. Example of unique sign (CU Certification, 2015)

5 CONCLUSION

Nowadays in Russia there is a quite complicated situation with getting the final permission to use the equipment. The manufacturer should fulfill all the requirements of all Rules, Standards and Technical Regulations that are in force in the territory of Russian Federation (Customs Union and National ones). Technical documentation should also be made in accordance with the obligatory requirements. This is quite difficult task, because most of Russian technical standards are different from European ones. The only possibility to avoid problems is to take this into account from the very beginning of the project, which will give the opportunity to make necessary amendments on the very first stages of the project, starting from the design documentation.

The original goals for thesis were set by the case company. The key points of the code changes and TR CU 032/2013 process guide were approved by them and evaluated as excellent. As a proof of company approval thesis material and the process guide are taken into use in their next coming Russian projects.

REFERENCES

CENCENELEC. European Standardization Organizations, [accessed on 01.12.2015]. Available from: http://www.cencenelec.eu/standards/ESOs/Pages/default.aspx

CENELEC. [accessed on 01.12.2015]. Available from: https://www.cenelec.eu/aboutcenelec/whoweare/index.html

CENELEC. European standards (EU), [accessed on 01.12.2015]. Available from: https://www.cenelec.eu/standardsdevelopment/ourproducts/europeanstandards.html

Custom Union Certification and Declaration. Custom Union Certificate – EAC, [accessed on 25.11.2015]. Available from: http://customsunioncertificate.com/customs-union-certificate/

Custom Union Certification and Declaration. Custom Union Declaration – EAC, [accessed on 25.11.2015]. Available from http://customsunioncertificate.com/customs-union-declaration/

DIRECTIVE 2014/68/EU of the European parliament and of the council of 15 May 2014 on the harmonization of the laws of the Member States relating to the making available on the market of pressure equipment Text with EEA relevance. Official Journal of the European Union. 27.06.2014 [accessed on 25.11.2015]. Available from: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014L0068

EEAS. EU-Russia technical regulation systems: further approximation (28/11/2011), [accessed on 10.02.2016]. Available from: http://eeas.europa.eu/delegations/russia/press_corner/all_news/news/2011/20111128_en.htm

ETSI. About ETSI, [accessed on 11.01.2016]. Available from: http://www.etsi.org/about

ETSI. Why we need standards, [accessed on 23.11.2015]. Available from: http://www.etsi.org/standards/why-we-need-standards

Europe Commission. Growth. Conformity assessment, [accessed on 20.01.2016] Available from: http://ec.europa.eu/growth/single-market/goods/building-blocks/conformity-assessment/index_en.htm

European Committee for standardization, [accessed on 10.12.2015]. Available from: https://en.wikipedia.org/wiki/European_Committee_for_Standardization

Finnish Standards Association SFS. European Union New Approach directives and standards, [accessed on 20.01.2016]. Available from: http://www.sfs.fi/en/publications_and_services/eu_new_approach_directives_and_standards

GOST R-Info. Certificate of Customs Union Russia, Kazakhstan, Belarus, [accessed on 25.01.2016 Available from: http://www.gost-r.info/customs-union-certificate.php

GOST, [accessed on 25.01.2016]. Available from: https://en.wikipedia.org/wiki/GOST

HSE. Conformity assessment, [accessed on 20.01.2016] Available from: http://www.hse.gov.uk/work-equipment-machinery/conformity.htm

INTERTEK. Russian Federation and customs union, (pdf file) [accessed on 25.11.2015]. Available from: http://www.intertek.com/uploadedFiles/Intertek/Divisions/Oil_Chemical_and_Agri/Media/pdfs/Exporter%20Guidelines%20Russia.pdf

ISO. Russian Federation (GOST R), [accessed on 25.01.2016]. Available from: http://www.iso.org/iso/about/iso_members/iso_member_body.htm?member_id=2176

ISO. Standards, [accessed on 23.11.2015]. Available from: http://www.iso.org/iso/home/standards.htm

ISO. What is conformity assessment?, [accessed on 25.01.2016]. Available from: http://www.iso.org/iso/home/about/conformity-assessment.htm

LIND, Jukka, 2016. Quality engineer. Varkaus. 2 Feb, 2016. Interview.

OECD, Environmental Policy and Regulation in RUSSIA, 2006, p. 50 (pdf document) [accessed on 10.02.2016] Available from: http://www.oecd.org/env/outreach/38118149.pdf

PALTMANN, Egon, 2016. Project engineering Manager. Varkaus. 19 Jan 2016. Interview.

Pressure Equipment Directive, [accessed on 01.02.2016]. Available from: https://en.wikipedia.org/wiki/Pressure_Equipment_Directive

Russian standard. List of technical regulations [accessed on 25.11.2015] Available from: http://www.russiancertification.com/technical_regulations.htm

Standartization supporting innovation and growth. European Standardization Organizations. 2nd edition, October 2010 [accessed on 11.03.2016] Available from: https://www.dke.de/de/Wirueberuns/Nutzen/Documents/Standardization%20supporting%20innovation%20and%20growth.pdf

STARCK, Tuukka, 2016. Quality engineer. Varkaus. 7 March 2016. Interview.

VARNESLAHTI, Patrik, 2016. Quality engineer. Varkaus. 15 Jan 2016. Interview.

ТР ТС 032/2013.Технический регламент Таможенного союза "О безопасности оборудования, работающего под избыточным давлением". Принятая постановлением Совета Евразийской Экономической Комиссии No .: 41, 02.07.2013, Москва [accessed on 03.11.2015]. Available from: http://www.gospromnadzor.by/docs/TR_TS_032-2013_text.pdf

APPENDIX 1: DECLARATION OF CONFORMITY EXAMPLE

ТАМОЖЕННЫЙ СОЮЗ
ДЕКЛАРАЦИЯ О СООТВЕТСТВИИ

Заявитель, Общество с ограниченной ответственностью «ХЕННЛИХ»

170008, Тверь, ул. Озерная, д. 16, корпус 1, Фактический адрес: 170008, Тверь, ул. Озерная, д. 16, корпус 1, тел. +74822630180, факс +74822630180, ОГРН 1106952026224

в лице Шик Мирослав, Руководитель

заявляет, что Ручной вакуумный насос HVP1

изготовитель: Sera GmbH, Улица Сера 1, 34376, Имменхаузен, Германия
Код ТН ВЭД ТС: 841504000
Серийный выпуск, по контракту №HRU0004/2012 от 01.01.2012 г.

соответствует требованиям

ТР ТС 010/2011 "О безопасности машин и оборудования"; ТР ТС 020/2011 "Электромагнитная совместимость технических средств"

Декларация о соответствии принята на основании

протокола испытаний № 516 от 04.12.2013 г. Испытательный центр ООО «АКАДЕМСИБ», рег. № РОСС RU.0001.21АВ09 от 01.03.2013, адрес: 630024, Новосибирская обл., г. Новосибирск, ул. Бетонная, д. 14

Дополнительная информация

Условия хранения продукции в соответствии с требованиями ГОСТ 15150-69. Срок хранения (службы, годности) указан в прилагаемой к продукции товаросопроводительной документации и/или эксплуатационной документации.

Декларация о соответствии действительна с даты регистрации по 12.12.2018 включительно.

	Шик Мирослав
(подпись)	(инициалы и фамилия руководителя организации-заявителя или физического лица, зарегистрированного в качестве индивидуального предпринимателя)
М.П.	

Сведения о регистрации декларации о соответствии:

Регистрационный номер декларации о соответствии: ТС № RU Д-DE.ММ04.В.01741

Дата регистрации декларации о соответствии: 13.12.2013

APPENDIX 2: CERTIFICATION OF CONFORMITY EXAMPLE

ТАМОЖЕННЫЙ СОЮЗ

EAC

СЕРТИФИКАТ СООТВЕТСТВИЯ

№ ТС BY/

Серия BY № 0002905

ОРГАН ПО СЕРТИФИКАЦИИ (Certification Body)

ЗАЯВИТЕЛЬ (Applicant- in most cases must be company registered in Customs Union)

ИЗГОТОВИТЕЛЬ (Manufacturer)

ПРОДУКЦИЯ (Products)

КОД ТН ВЭД ТС (HS Code)

СООТВЕТСТВУЕТ ТРЕБОВАНИЯМ

Technical regulations and standards applied to the product

СЕРТИФИКАТ ВЫДАН НА ОСНОВАНИИ

Certificate is issued on basis (Test reports, factory audits, ISO certificate)

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ (Additional information)

Valid date

СРОК ДЕЙСТВИЯ С _____ ПО _____

М.П.

Руководитель (уполномоченное лицо) органа по сертификации _____ _____

Эксперт-аудитор (эксперт) _____ _____

APPENDIX 3: CLASSIFICATION OF EQUIPMENT BY CATEGORIES OF HAZARDS

Table 1. Categories of vessels for gases and used for working mediums of group 1

Equipment category	**Equipment capacity (m^3)**	**The product of the maximum allowable operating pressure and capacity values (MPa * m^3)**	**Maximum allowable operating pressure (MPa)**
1st	more than 0.001	more than 0.0025, up to 0.005, inclusive	more than 0.05
2nd	more than 0.001	more than 0.005, up to 0.02, inclusive	more than 0.05
3rd	more than 0.0001, up to 0.001, inclusive	not standardized	more than 20, up to 100, inclusive
	more than 0.001	more than 0.02, up to 0.1, inclusive	more than 0.05
4th	more than 0.0001, up to 0.001, inclusive	not standardized	more than 100
	more than 0.001	more than 0.1	more than 0.05

Table 2. Categories of vessels for gases and used for working mediums of group 2

Equipment category	**Equipment capacity (m^3)**	**The product of the maximum allowable operating pressure and capacity values (MPa * m^3)**	**Maximum allowable operating pressure (MPa)**
1st	more than 0.001	more than 0.005, up to 0.02, inclusive	more than 0.05
2nd	more than 0.001	more than 0.02, up to 0.1, inclusive	more than 0.05
3rd	more than 0.0001, up to 0.001, inclusive	not standardized	more than 100, up to 300, inclusive
	more than 0.001, up to 1, inclusive	more than 0.1, up to 0.3, inclusive	more than 0.05
	more than 1	not standardized	more than 0.05, up to 0.4, inclusive
4th	more than 0.0001, up to 0.001, inclusive	not standardized	more than 300
	more than 0.001, up to 1, inclusive	more than 0.3	more than 0.4
	more than 1	not standardized	more than 0.4

Table 3. Categories of vessels for liquids and used for working mediums of group 1

Equipment category	Equipment capacity (m^3)	The product of the maximum allowable operating pressure and capacity values (MPa * m^3)	Maximum allowable operating pressure (MPa)
1st	more than 0.01	more than 0.02	more than 0.05, up to 1, inclusive
2nd	more than 0.001	more than 0.02	more than 1, up to 50, inclusive
	more than 0.0001, up to 0.001, inclusive	not standardized	more than 50
3rd	more than 0.001	not standardized	more than 50

Table 4. Categories of vessels for liquids and used for working mediums of group 2

Equipment category	Equipment capacity (m^3)	The product of the maximum allowable operating pressure and capacity values (MPa * m^3)	Maximum allowable operating pressure (MPa)
1st	more than 0.01	more than 1	more than 1, up to 50, inclusive
2nd	more than 0.0001, up to 0.01, inclusive	not standardized	more than 100
	more than 0.01	more than 1	more than 50

Table 5. Categories of steam, hot water boilers and fired vessels

Equipment category	Equipment capacity (m^3)	The product of the maximum allowable operating pressure and capacity values (MPa * m^3)	Maximum allowable operating pressure (MPa)
1st	more than 0.002, up to 0.1, inclusive	up to 0,005, inclusive	more than 0.05
2nd	more than 0.002, up to 0.4, inclusive	more than 0.005, up to 0.02, inclusive	more than 0.05, up to 3.2, inclusive
3rd	more than 0.002, up to 1, inclusive	more than 0.02, up to 0.3, inclusive	more than 0.05, up to 3.2, inclusive
4th	more than 0.002, up to 0.01, inclusive	not standardized	more than 3.2
	more than 0.01, up to 1, inclusive	more than 0.3	more than 0.3
	more than 1	not standardized	more than 0.05

Table 6: Categories of pipelines for gases and vapours and used for working mediums of group 1

Equipment category	Nominal diameter (mm)	The product of the maximum allowable operating pressure and nominal diameter values (MPa * mm)	Maximum allowable operating pressure (MPa)
1st	more than 25, up to 100, inclusive	not standardized	more than 0.05, up to 1, inclusive
	more than 25, up to 100, inclusive	up to 100, inclusive	more than 1, up to 3.5, inclusive
2nd	more than 100, up to 350, inclusive	not standardized	more than 0.05, up to 1, inclusive
	more than 25, up to 350, inclusive	more than 100, up to 350, inclusive	more than 1, up to 3.5, inclusive
	more than 25, up to 100, inclusive	not standardized	more than 3.5
3rd	more than 350	not standardized	more than 0.05, up to 1, inclusive
	more than 100, up to 350, inclusive	more than 350	more than 1, up to 3.5, inclusive
	more than 100	not standardized	more than 3.5

Table 7: Categories of pipelines for gases and vapours and used for working mediums of group 2

Equipment category	Nominal diameter (mm)	The product of the maximum allowable operating pressure and nominal diameter values (MPa * mm)	Maximum allowable operating pressure (MPa)
1st	more than 32	more than 100, up to 350, inclusive	more than 0.05, up to 3.2, inclusive
	from 32, up to 100, inclusive	not standardized	more than 3.2
2nd	more than 100	more than 350, up to 500, inclusive	more than 0.05, up to 3.2, inclusive
	more than 100, up to 250, inclusive	not standardized	more than 3.2
3rd	more than 250		more than 3.2
	more than 250	more than 500	more than 0.05, up to 3.2, inclusive

Table 8: Categories of pipelines for liquids and used for working mediums of group 1

Equipment category	Nominal diameter (mm)	The product of the maximum allowable operating pressure and nominal diameter values (MPa * mm)	Maximum allowable operating pressure (MPa)
1st	more than 25	more than 200	more than 0.05, up to 1, inclusive
2nd	more than 25	more than 200	more than 1, up to 8, inclusive
	more than 25	more than 350	more than 8, up to 50, inclusive
3rd	more than 25	not standardized	more than 50

Table 9: Categories of pipelines for liquids and used for working mediums of group 2

Equipment category	Nominal diameter (mm)	The product of the maximum allowable operating pressure and nominal diameter values (MPa * mm)	Maximum allowable operating pressure (MPa)
1st	more than 200	more than 500	more than 1, up to 50, inclusive
2nd	more than 200	not standardized	more than 50